SITE DATA

1. OWNER ADDRESS: STATE OF DELAWARE
BOX B
BEAR, DE 19701

2. PROPERTY ADDRESS: 1533 DELAWARE RIVER
NEW CASTLE, DE 19720

3. TAX PARCEL NUMBERS: 12-010.00-001

4. AREA OF PARCEL: 273.2± ACRES

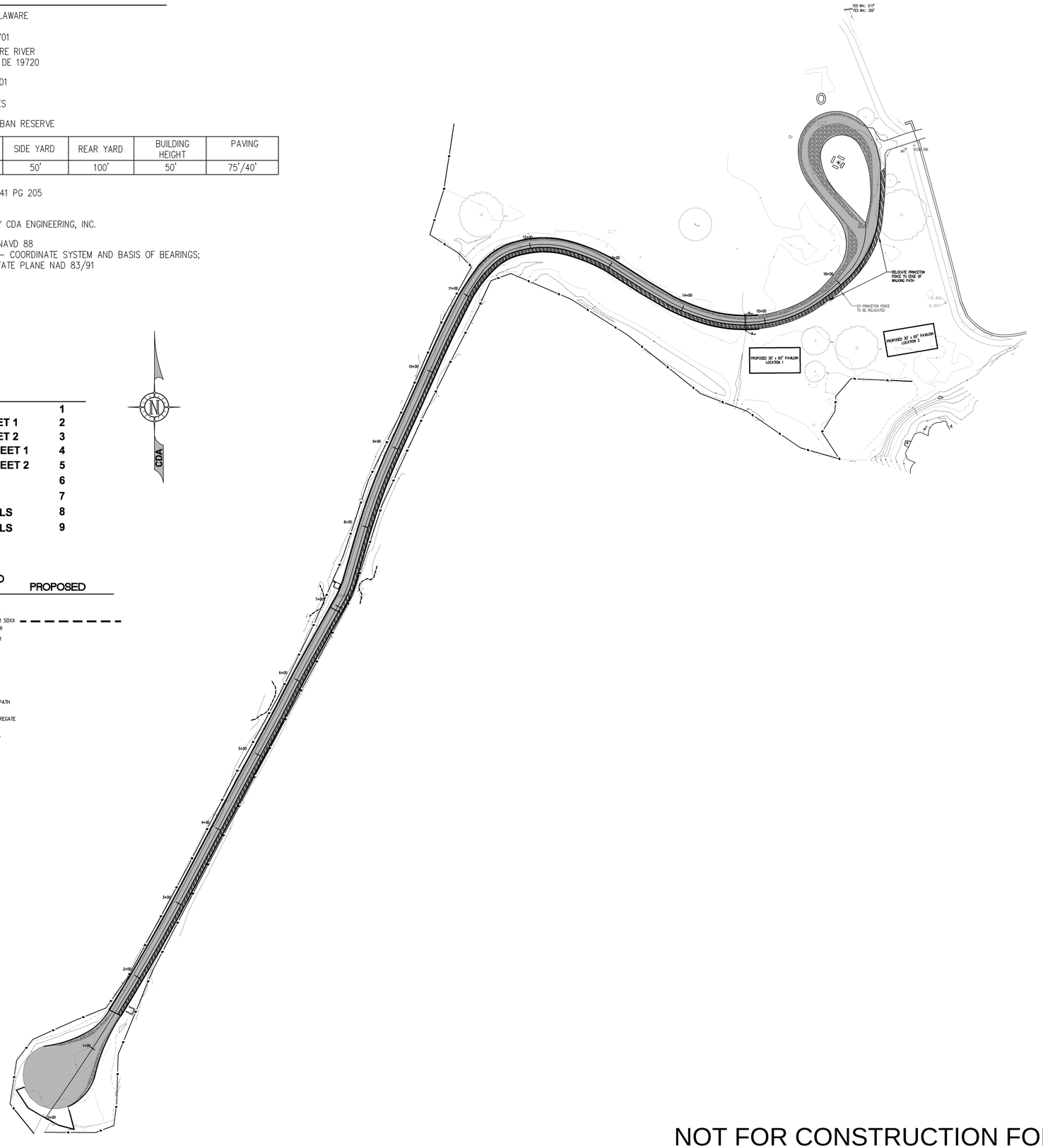
5. ZONING: SR – SUBURBAN RESERVE

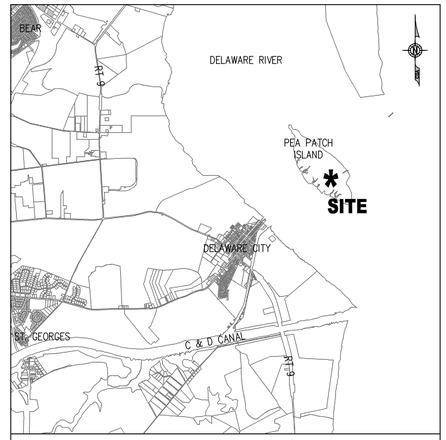
LOT AREA	LOT WIDTH	STREET YARD	SIDE YARD	REAR YARD	BUILDING HEIGHT	PAVING
5 AC.	300'	100'	50'	100'	50'	75'/40'

6. DEED REFERENCE: DEED BOOK 141 PG 205

7. DATE OF SURVEY: JULY 2018 BY CDA ENGINEERING, INC.

8. DATUM: VERTICAL – NAVD 88
HORIZONTAL – COORDINATE SYSTEM AND BASIS OF BEARINGS;
DELAWARE STATE PLANE NAD 83/91





LOCATION MAP SCALE: 1"=1 MILE

SHEET INDEX

LEGEND

EXISTING		PROPOSED
WL	WETLANDS	
	WETLANDS FLAG	
	COMPOST FILTER SOXX	
	MAJOR CONTOUR	
	MINOR CONTOUR	
	STORM PIPE	
	TREE	
	ERODED TRAVEL PATH	
	DRIVABLE SURFACE AGGREGATE	
	WALKING TRAIL	

REVISION	DATE
JPP SUBMISSION	9.12.18

CDA ENGINEERING INC.

CIVIL/SITE ENGINEERING AND LAND PLANNING

6 LARCH AVENUE
SUITE 401
WILMINGTON, DE 19804

Tel: 302 998 9202
Fax: 302 691 1314
cdaengineering.com

DRAWN BY: PJM
CHECKED BY: CD
PROJECT No.: 18.135.00
SCALE: 1"=60'
DATE: 8.30.18
CAD FILE: ...\DWG\REC\1813500 BASE.DWG

0' 30' 60' 120'
1"=60'

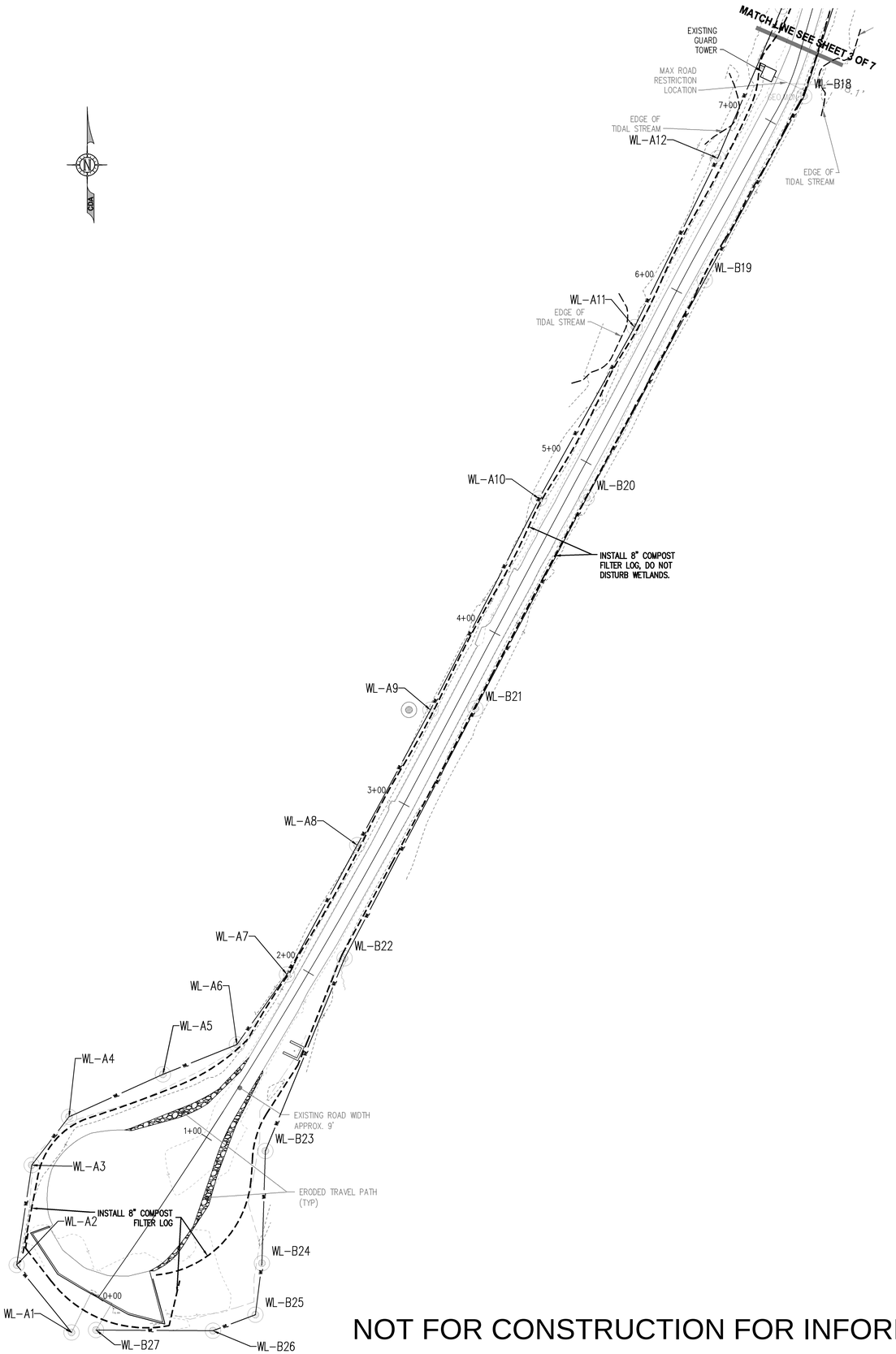
APPLICATION No.
TOPOGRAPHIC SURVEY
OF
STATE OF DELAWARE
PEA PATCH ISLAND
TRAM WAY

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **INDEX SHEET**

DRAWING NUMBER: **1 of 9**

NOT FOR CONSTRUCTION FOR INFORMATION ONLY



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0' 15' 30' 60'
1"=30'

APPLICATION No.
TOPOGRAPHIC SURVEY
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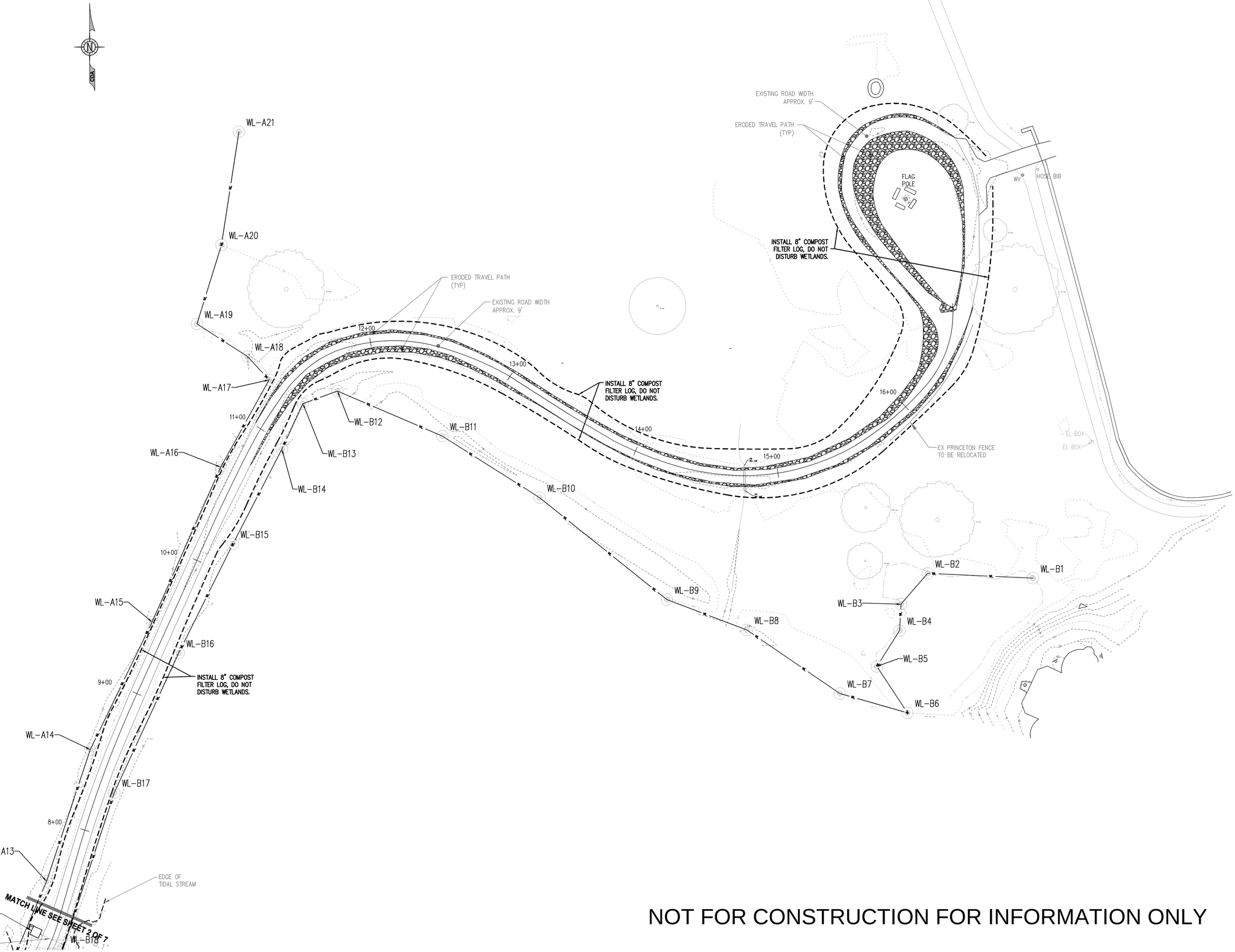
STATE OF DELAWARE
PEA PATCH ISLAND
TRAM WAY

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EXISTING CONDITIONS TOPOGRAPHIC SURVEY PLAN**

DRAWING NUMBER: **2 of 9**



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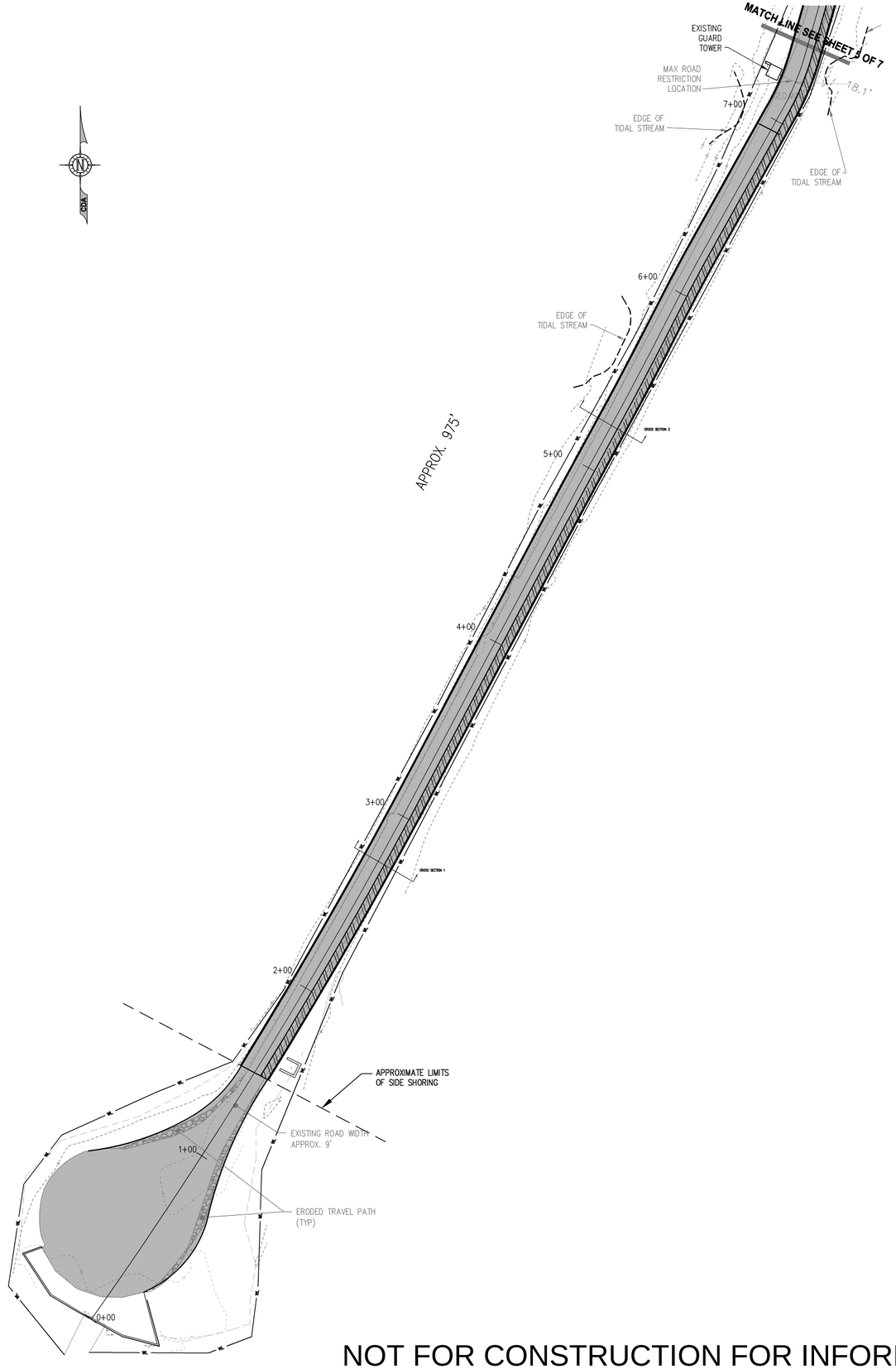
RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EXISTING CONDITIONS TOPOGRAPHIC SURVEY PLAN**

DRAWING NUMBER: **3 of 9**



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PEA PATCH ISLAND
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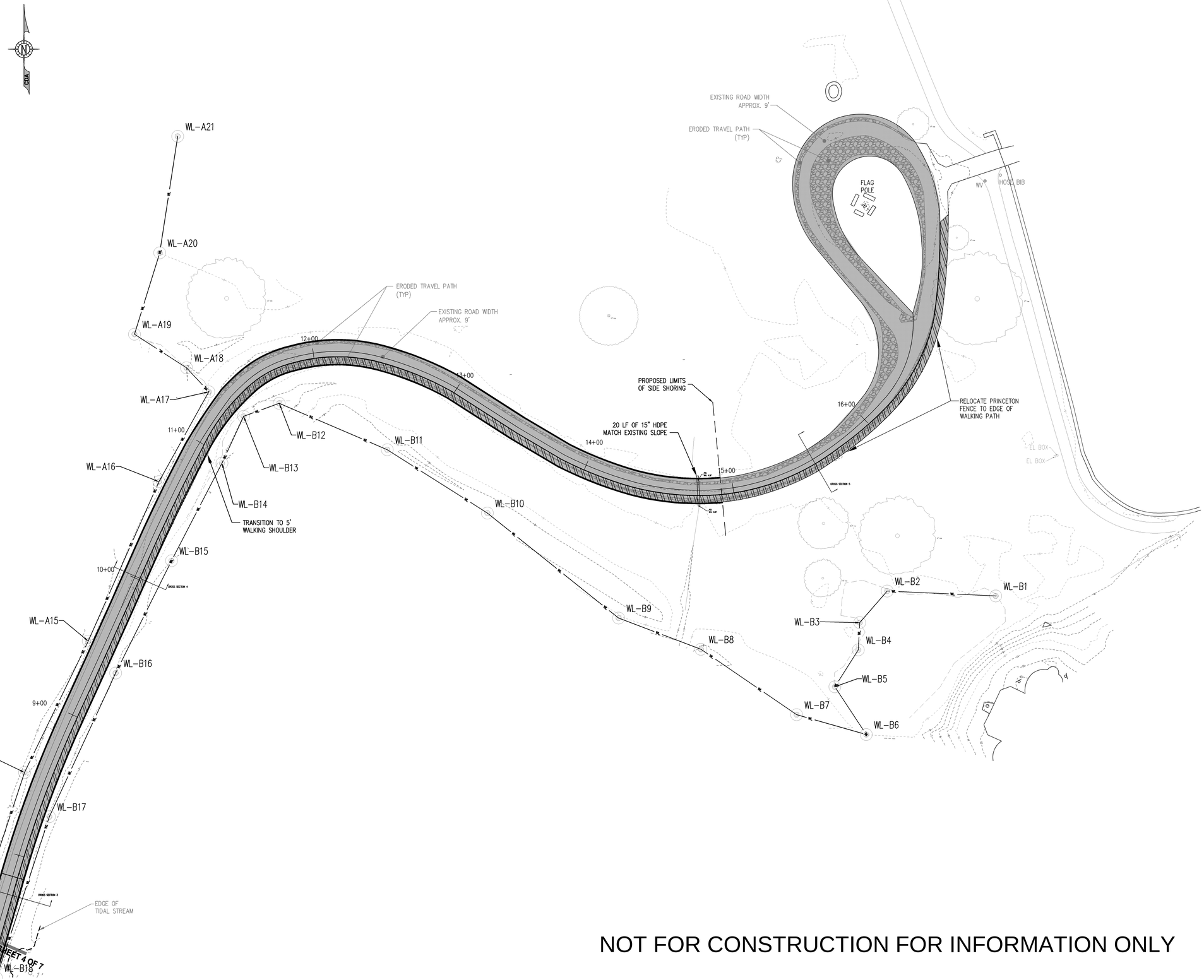
RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EXISTING CONDITIONS TOPOGRAPHIC SURVEY PLAN**

DRAWING NUMBER: **4 of 9**



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APPLICATION No.
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PEA PATCH ISLAND
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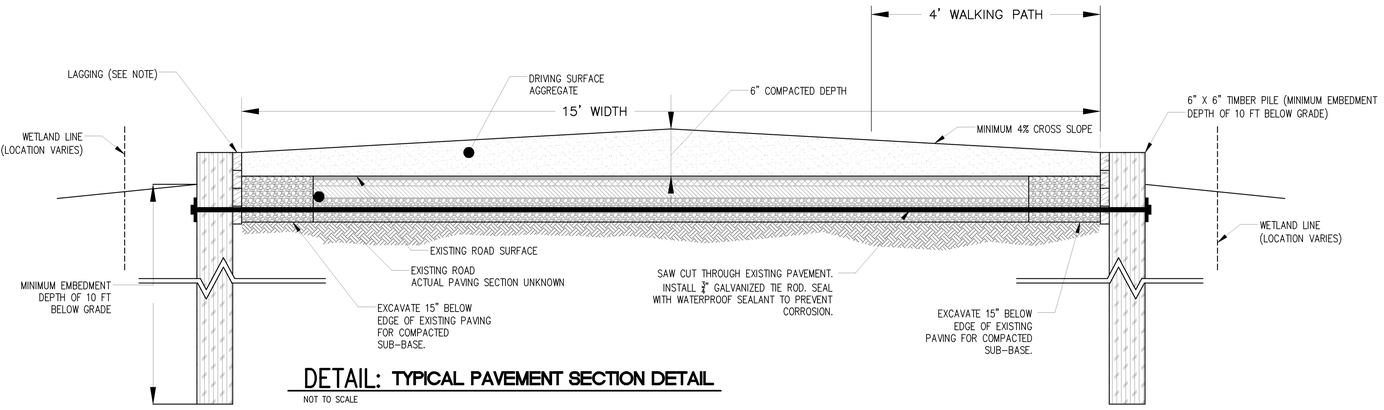
RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EXISTING CONDITIONS TOPOGRAPHIC SURVEY PLAN**

DRAWING NUMBER: **5 of 9**



DETAIL: TYPICAL PAVEMENT SECTION DETAIL

NOT TO SCALE

*NOTE:

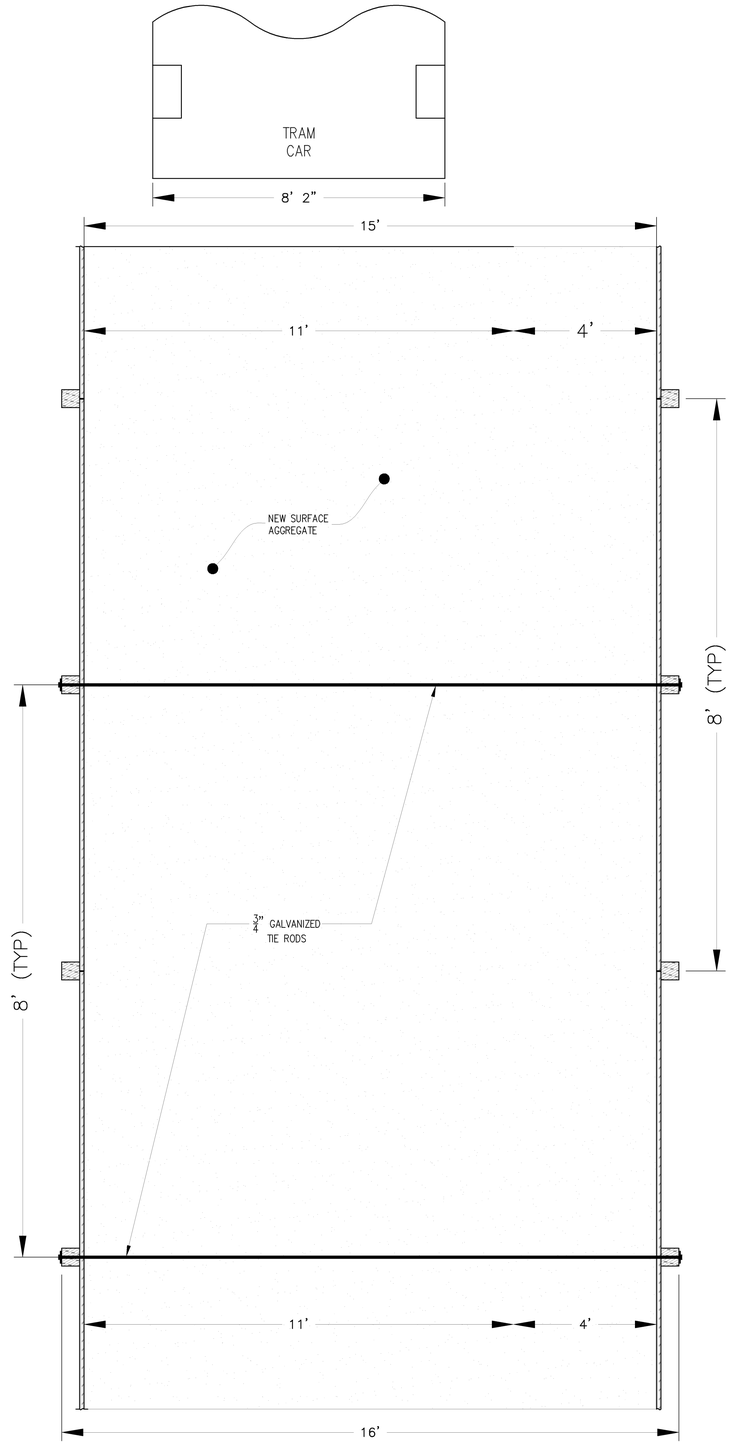
CONTRACTOR TO SELECT 16 FT LONG, MIXED HARDWOOD 6"x6" PRESSURE TREATED POSTS, FREE FROM DEFECTS FOR DRIVING. PILES ARE TO BE DRIVEN PLUMB, WITH CARE TAKEN TO AVOID DAMAGE TO THE POST TO ALLOW ATTACHMENT OF LAGGING AND TIE ROD.

POST TO BE DRIVEN TO A MINIMUM EMBEDDED DEPTH OF 10 FT UNLESS OTHERWISE DIRECTED BY GEOTECHNICAL ENGINEER.

POSTS TO BE SPACED AT A MAXIMUM OF 4 FT ON-CENTER. CONTRACTOR TO FIELD ADJUST AS NEEDED TO AVOID CONFLICTS ENCOUNTERED IN THE FIELD.

TIE ROD TO BE SPACED EVERY OTHER SET OF POSTS AS SHOWN IN THE TYPICAL PLAN VIEW. MAXIMUM SEPARATION OF 8 FT ON CENTER.

LAGGING SHALL BE NOMINAL 3" MIXED HARDWOOD PRESSURE TREATED LUMBER, FREE FROM DEFECTS.



DETAIL: TYPICAL PLAN VIEW

NOT TO SCALE

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APPLICATION No.
TOPOGRAPHIC SURVEY
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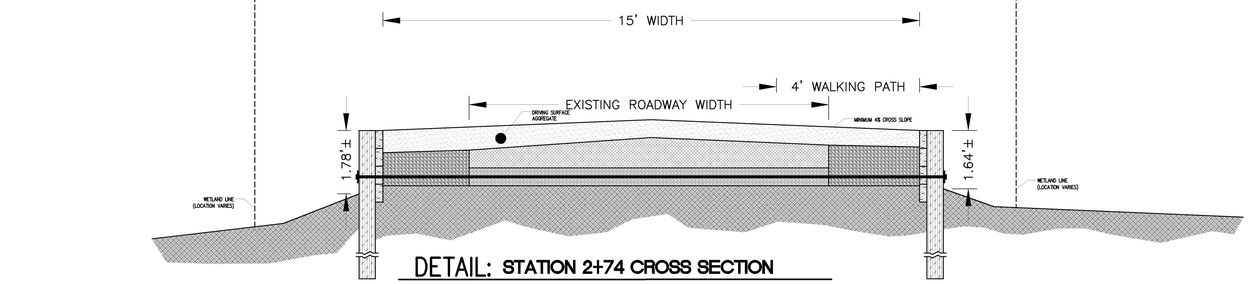
STATE OF DELAWARE
PEA PATCH ISLAND
TRAM WAY

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

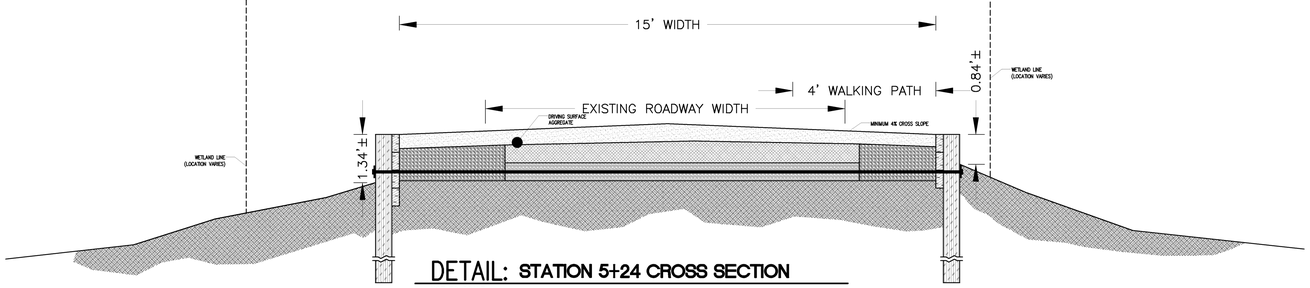
DRAWING TITLE: **ROAD CROSS SECTION DETAILS**

DRAWING NUMBER: **6 of 9**



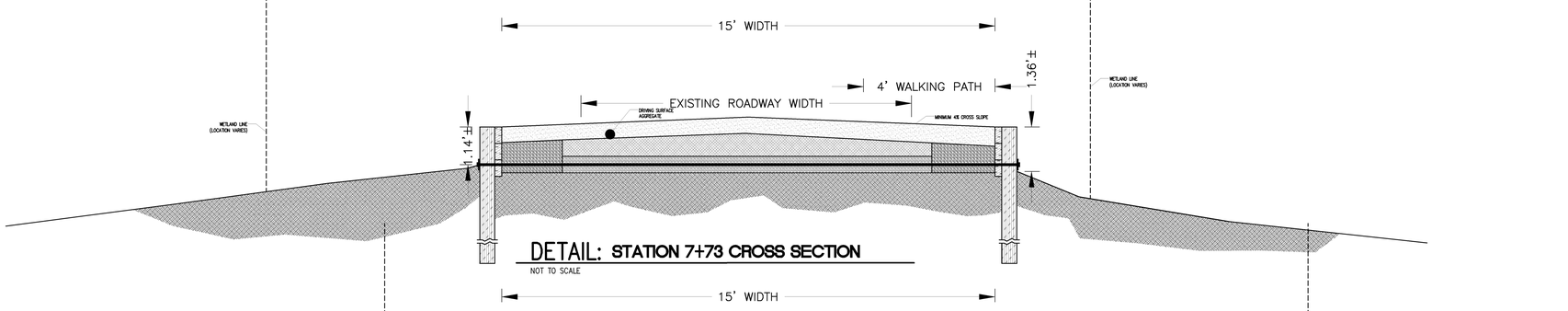
DETAIL: STATION 2+74 CROSS SECTION

NOT TO SCALE



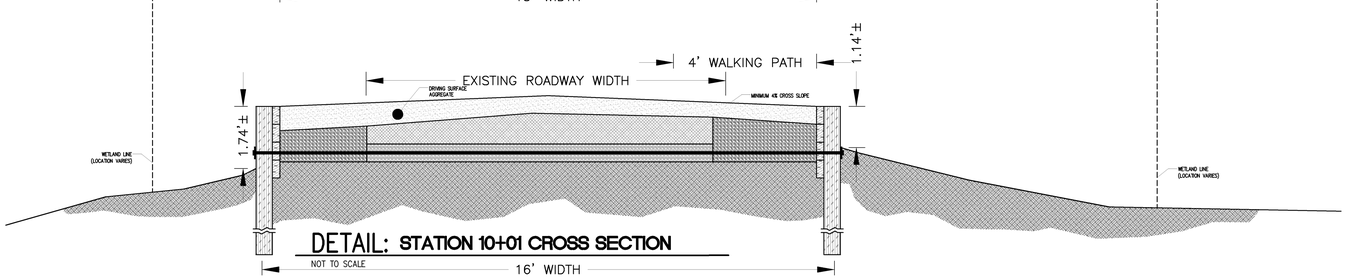
DETAIL: STATION 5+24 CROSS SECTION

NOT TO SCALE



DETAIL: STATION 7+73 CROSS SECTION

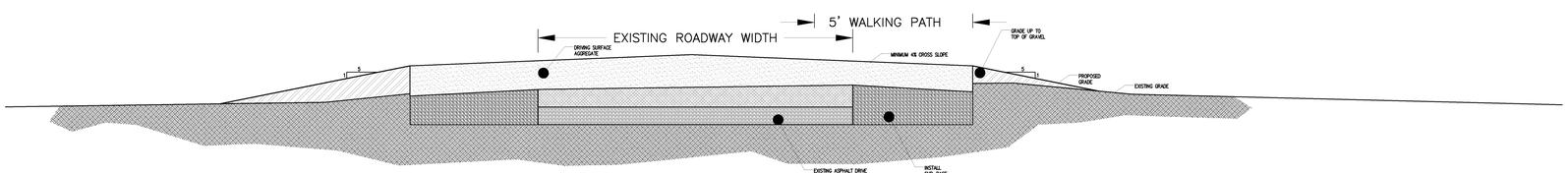
NOT TO SCALE



DETAIL: STATION 10+01 CROSS SECTION

NOT TO SCALE

16' WIDTH



DETAIL: STATION 15+56 CROSS SECTION

NOT TO SCALE

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APPLICATION No.
TOPOGRAPHIC SURVEY

OF

STATE OF DELAWARE
PEA PATCH ISLAND
TRAM WAY

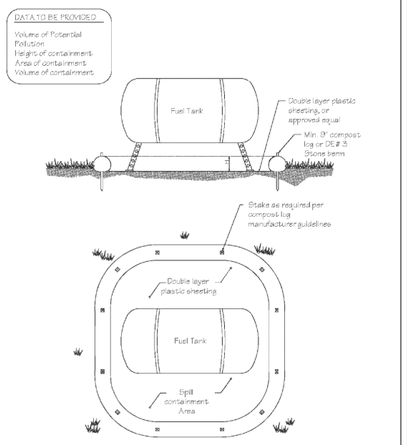
RED LION HUNDRED | NEW CASTLE COUNTY | DELAWARE

DRAWING TITLE: **ROAD CROSS SECTIONS**

DRAWING NUMBER: **7 of 9**

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control



Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 1 of 5 Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Pollution Prevention – Spill Prevention

1. Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
2. Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
3. Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-on and runoff.
4. Use barriers such as berms to prevent storm water run-on and runoff, and to contain spills.
5. Place a "Fueling Area" sign next to each fueling area.
6. Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
7. Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
8. Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
9. If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
10. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.

CLEAN UP SPILLS

1. If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
2. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
3. Do not bury spills or wash them down with water.

LEAKS AND DRIPS

1. Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
2. Do not allow oil, grease, fuel or chemicals to drip onto the ground.
3. Have spill kits and clean up material on-site.
4. Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
5. Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
6. Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 2 of 5 Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes:

The Construction Site Pollution Prevention Plan should include the following elements:

1. **Material Inventory**

   Document the storage and use of the following materials:

   a. Concrete
   b. Detergents
   c. Paints (enamel and latex)
   d. Cleaning solvents
   e. Pesticides
   f. Wood scraps
   g. Fertilizers
   h. Petroleum based products

2. **Good housekeeping practices**
   a. Store only enough product required to do the job.
   b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
   c. Substances shall not be mixed.
   d. When possible, all of a product shall be used up prior to disposal of the container.
   e. Manufacturers' instructions for disposal shall be strictly adhered to.
   f. The site foreman shall designate someone to inspect all BMPs daily.

3. **Waste management practices**
   a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
   b. Waste materials shall be salvaged and/or recycled whenever possible.
   c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 3 of 5 Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

   d. Trash shall be disposed of in accordance with all applicable Delaware laws.
   e. Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
   f. If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.

4. **Equipment maintenance practices**
   a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
   b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
   c. Drip pans shall be used for all equipment maintenance.
   d. Equipment shall be inspected for leaks on a daily basis.
   e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
   f. Fuel nozzles shall be equipped with automatic shut-off valves.
   g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.

5. **Spill prevention practices**
   a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
   b. Warning signs shall be posted in hazardous material storage areas.
   c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
   d. Low or non-toxic substances shall be prioritized for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 4 of 5 Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

   e. Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.

6. **Education**
   a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
   b. Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

CONTACT INFORMATION

DNREC 24-Hour Toll Free Number	**800-662-8802**
DNREC Solid & Hazardous Waste Branch	**302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 5 of 5 Effective April 2016

NOTES FOR CONSTRUCTION

1. ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE FOLLOWING:
   – NEW CASTLE COUNTY STANDARDS FOR CONSTRUCTION, LATEST REVISION
   – STATE OF DELAWARE, DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST REVISION.
   – STATE OF DELAWARE, DEPARTMENT OF TRANSPORTATION DETAIL STANDARDS, LAST REVISION
   IF A CONFLICT EXISTS BETWEEN STANDARDS, THE MORE STRINGENT SHALL APPLY.
2. EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS PRIOR TO COMMENCEMENT OF WORK. MISS UTILITY SHALL BE NOTIFIED THREE (3) WORKING DAYS PRIOR TO EXCAVATION AT 1-800-282-8555.
3. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO PROTECT ALL EXISTING TREES AND SITE FEATURES. CONTRACTOR SHALL CONTACT OWNER WHEN EXCAVATING NEAR LARGE TREES. OWNER SHALL CUT ROOTS CLEANLY TO MINIMIZE DAMAGE TO TREES. OWNER SHALL PROVIDE MULCH WHERE REQUIRED AND PROVIDE FINAL GRADING AND RAKING. SHOULD ANY TREES, FENCES, OR OTHER SITE FEATURES BE DAMAGED OR DESTROYED DUE TO THE CONTRACTOR'S NEGLIGENCE, THE CONTRACTOR SHALL BEAR THE COST AND RESPONSIBILITY FOR REPAIR AND/OR REPLACEMENT OF THE DAMAGED ITEMS.
4. ALL CONCRETE SHALL BE 4,500 PSI, UNLESS OTHERWISE SPECIFIED, AND BE PER NEW CASTLE COUNTY STANDARDS. CONCRETE ENTRANCE APRON SHALL BE 5,000 PSI (SEE DETAIL).
5. ALL BACKFILL MATERIALS AND COMPACTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH APPLICABLE DNREC AND NEW CASTLE COUNTY STANDARDS AND AS SHOWN ON THESE PLANS.
6. CONTRACTOR MUST ENSURE ALL SOIL IS FREE OF ALL FOREIGN MATERIALS (I.E. CONCRETE, REAR, PLASTIC, TRASH, ASPHALT, ETC.). CONTRACTOR MUST NOT PROOF-ROLL AND SHALL MINIMIZE COMPACTION OF SUB-SOILS WHERE TURF, LANDSCAPING, AND/OR OTHER AREAS NOT INTENDED FOR HARDSCAPE OR PAVING. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR OPERATE EQUIPMENT ON GRASS AREAS OUTSIDE THE FENCED CONSTRUCTION AREA.
7. MATCH PROPOSED PAVEMENT GRADES TO EXISTING WHEREVER THEY ADJOIN.
8. SITE CONTRACTOR IS RESPONSIBLE FOR FULL TOPSOIL RESTORATION OF ALL DISTURBED AREAS. FOR LAWN AREAS, CONTRACTOR SHALL PLACE MINIMUM 6" APPROVED TOPSOIL EVENLY SPREAD OVER SITE.
9. CONTRACTOR SHALL REIMBURSE DNREC FOR SITE RESTORATION OUTSIDE LIMITS OF DISTURBANCE IDENTIFIED ON BID DOCUMENTS.
10. THE CONTRACTOR WILL PROTECT THE PUBLIC AT ALL TIMES. THE WORK AREA WILL BE PROPERLY BARRICADED OFF WITH BARRICADES, SAFETY FENCE, CAUTION TAPE, ETC. TO KEEP PEDESTRIANS OUT OF THE WORK AREA. THE WORK AREA WILL BE LEFT IN A SAFE CONDITION AT THE END OF EACH WORK DAY. FOR EACH PHASE OF CONSTRUCTION, CONTRACTOR SHALL MAINTAIN SECURE PERIMETER AROUND WORK AREA. CONTRACTOR SHALL MAINTAIN FIRE ACCESS AS SHOWN ON PLANS.
11. CONTRACTOR SHALL COORDINATE WITH DNREC FOR ALL REQUIRED TREE PROTECTION AND SITE RESTORATION.

GENERAL NOTES FOR EROSION AND SEDIMENT CONTROL

1. NOTIFY NEW CASTLE COUNTY (5) FIVE DAYS PRIOR TO COMMENCING WITH CONSTRUCTION.
2. REVIEW AND/OR APPROVAL OF THE SEDIMENT AND EROSION CONTROL PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE REQUIREMENTS OF THE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS IN THE APPROVED PLAN.
3. IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY DNREC.
4. FOLLOWING SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 14 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER SEDIMENT CONTROLS, SOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
5. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE "DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK", LATEST REVISION.
6. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES FOUND NECESSARY TO CONTROL EROSION AND SEDIMENTATION ON THE SITE DUE TO UNFORESEEN SITUATIONS IN THE DESIGN STAGE SHALL BE INSTALLED IN ACCORDANCE WITH THE "DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK", LATEST REVISION, AS DIRECTED BY THE CITY INSPECTOR AND/OR THE STATE'S REPRESENTATIVE.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND/OR AFTER EACH RAIN EVENT AND REPAIR AS NEEDED. THE CONTRACTOR SHALL INSPECT SILT FENCE DAILY AND MAKE ALL REQUIRED REPAIRS IMMEDIATELY.
8. ALL PERIMETER CONTROLS FOR EROSION AND SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO ANY OTHER LAND DISTURBING ACTIVITIES.
9. WATER SHALL BE SPRAYED ON EXPOSED SURFACES SHOULD DUST BECOME EXCESSIVE (AS DETERMINED BY DNREC INSPECTOR OR STATE'S REPRESENTATIVE.
10. SOIL STOCKPILE AREAS SHALL BE SEEDED AND SURROUNDED BY SILT FENCE.
11. CONTRACTOR SHALL INSTALL SOIL EROSION & SEDIMENT CONTROL MEASURES TO MINIMIZE THE REMOVAL OF AND/OR DAMAGE TO EXISTING TREES AND VEGETATION.
12. VOLUME OF SPOIL AND/OR BORROW MATERIAL = 0± NET CY (GENERALLY BALANCED SITE)
13. THE LIMITS OF DISTURBANCE MUST BE CLEARLY DEFINED IN THE FIELD (I.E. BY SILT FENCE OR ORANGE SAFETY FENCING).
14. ANY DEWATERING OPERATIONS REQUIRE A DNREC WELL PERMIT. CONTRACTOR SHALL REQUEST PERMIT PRIOR TO CONSTRUCTION.

SEQUENCE OF CONSTRUCTION

1. NOTIFY MISS UTILITY THREE (3) DAYS PRIOR TO COMMENCING CONSTRUCTION. (1-800-282-8555)
2. NOTIFY NEW CASTLE COUNTY DEPARTMENT OF PUBLIC WORKS IN WRITING AT LEAST FIVE (5) DAYS PRIOR TO COMMENCING WITH CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
3. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHOULD BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENTATION ON THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.
4. INSTALL PERIMETER CONTROLS AS SHOWN ON PLANS.
5. PERFORM ALL GRADING AND LAND DISTURBING ACTIVITIES ACCORDING TO THE APPROVED SEDIMENT AND STORMWATER PLANS.
6. ONCE FINAL GRADE IS ACHIEVED ANYWHERE ON-SITE, THOSE AREAS MUST BE STABILIZED IMMEDIATELY WITH EITHER PERMANENT VEGETATIVE STABILIZATION OR EROSION CONTROL MATTING AS DIRECTED BY CITY AND/OR CCR.
7. IMMEDIATELY AFTER ALL SITE CONSTRUCTION IS COMPLETED, PLACE TOPSOIL AND PERMANENT SEEDING AND MULCHING OVER ALL DISTURBED AREAS AND STABILIZE.
8. EROSION AND SEDIMENT CONTROL DEVICES SHOULD BE REMOVED ONLY AFTER WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.

NOT FOR CONSTRUCTION FOR INFORMATION ONLY

REVISION	DATE
JPP SUBMISSION	9.12.18

CDA ENGINEERING INC.

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DRAWN BY:	**PJM**
CHECKED BY:	**CD**
PROJECT No.:	**18.135.00**
SCALE:	**AS SHOWN**
DATE:	**8.30.18**
CAD FILE:	**...\DWG\REC\1813500 BASE.DWG**

APPLICATION No.
TOPOGRAPHIC SURVEY

OF

STATE OF DELAWARE PEA PATCH ISLAND TRAM WAY

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EROSION & SEDIMENTATION DETAILS**

DRAWING NUMBER: **8 of 9**

Standard Detail & Specifications
Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[6]	Seeding Rate		Optimum Seeding Dates [1] O = Optimum Planting Period A = Acceptable Planting Period								Planting Depth[2]
				Coastal Plain			Piedmont			All		
	Certified Seed	lb/Ac [3]	lb/1000 sq ft	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1		
1	Barley	125	4	O	A	O	O	A	O			1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A			1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A		1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O			0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A		0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A		1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O				0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O				0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seeding rate of any of the above species.
5. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
6. Warm season grasses such as Millet or Weeping Lovegrass may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 1 of 4 Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures	Seeding Rate [1]		Optimum Seeding Dates [2] O = Optimum Planting Period A = Acceptable Planting Period								Remarks
				Coastal Plain			Piedmont			All		
	Well Drained Soils	lb/Ac	lb/1000 sq ft	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1		
1	Tall Fescue Weeping Lovegrass	140 10	3.2 0.23	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye		Good erosion control mix Tolerant of low fertility soils. Lovegrass very difficult to mow; Germinates only in hot weather.
2	Deertongue Sheep Fescue Common Lespedeza[5] inoculated	30 30 15	0.68 0.69 0.35	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye		Good erosion control mix Tolerant of low fertility soils. Good wildlife cover and food
3	Tall Fescue (Turf-type) or Strong Creeping Red Fescue or Perennial Ryegrass plus Flatpea[5]	50 50 50 15	1.15 1.15 1.15 0.34	O	A	O	O	A	O	Add 100 lbs./ac Winter Rye		Good erosion control mix Tall Fescue for drought conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass or Redtop plus White Clover[5]	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A	O	O	A	O	Add 100 lbs./ac Winter Rye		Suitable waterway mix. Caneda Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass[7] or Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O				Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds.
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A	O	O	A	O			Managed filter strip for nutrient uptake.
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A	O	O	A	O			Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem Indian Grass Little Bluestem Creeping Red Fescue plus one of: Partridge Pea Bush Clover Wild Indigo Showy Tick-Trefoil	10 10 8 30 6 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A		O	A				All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 2 of 4 Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Seeding Mixtures	Seeding Rate [1]		Optimum Seeding Dates [2] O = Optimum Planting Period A = Acceptable Planting Period								Remarks
				Coastal Plain			Piedmont			All		
	Poorly Drained Soils	lb/Ac	lb/1000 sq ft	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1		
9	Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 35 30 45	1.72 0.8 0.69 1	O	A	O	O	A	O	Add 100 lbs./ac Winter Rye		Quick stabilization of disturbed sites and waterways.
10	Reed Canarygrass[7]	10	0.23	A		O	A		O			Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns											
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A	O	O	A	O			High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A	O	O	A	O			Moderate value, low maintenance, traffic tolerant.
13	Creeping Red Fescue Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 50 20 20	1.15 1.15 0.4 0.4	O	A	O	O	A	O			Shade tolerant, moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass or Chewings Fescue	50 90	1.15 2.1	O	A	O	O	A	O			Shade tolerant, moisture tolerant.
15	K-31 Tall Fescue	150	3.5	O	A	O	O	A	O			Monoculture, but performs well alone in lawns. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Section 1, Chapter 26, Title 3 of the Delaware Code.
4. Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. All leguminous seed must be inoculated.
6. Warm season grass mix and Reed Canary Grass cannot be mowed more than 4 times per year.
7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate, and will remain dormant until then.

⚠ **RECOMMENDED SEED MIXTURE**

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 3 of 4 Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

Construction Notes:

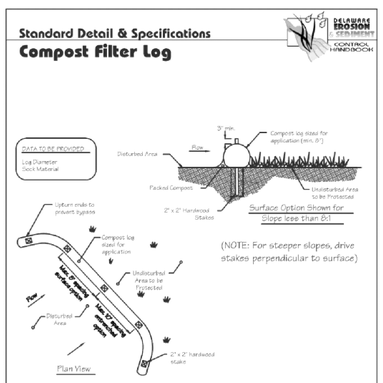
1. Site Preparation
   a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
   b. Final grading and shaping is not necessary for temporary seedings.
2. Seedbed Preparation

   It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
   a. Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
   b. Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.
4. Seeding
   a. For **temporary stabilization**, select a mixture from **Sheet 1 .** For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions.
   b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
   c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
5. Mulching

   All mulching shall be done in accordance with detail **DE-ESC-3.4.5**.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 4 of 4 Effective April 2016

Standard Detail & Specifications
Compost Filter Log



Source:	Symbol:	Detail No.
Adopted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	**DE-ESC-3.1.7** Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications
Compost Filter Log

Construction Notes:

1. Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
2. Fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
3. For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
4. Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, upturn at a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
5. For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
6. Stake the filled log every 10 feet maximum through the center of the sock for trenched applications, or every 8 feet for untrenched. The stake shall be a 2" by 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 8:1, the stake shall be angled downslope at a 45 degree angle to prevent the force of the water from dislodging to log.
7. When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
8. Remove accumulated sediment when it has reached half of the effective height of the log.
9. Inspect weekly and after rain event. If sock is degrading or the sock is failing, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "fluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source:	Symbol:	Detail No.
Adopted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	**DE-ESC-3.1.7** Sheet 2 of 2

Effective April 2016

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